AF/CTR

PATENT
Attorney Docket No.: SP00-038A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor:	Bumgarner, Kirk P et al.	
Serial No:	10/800551	Examiner: Langdon, Evan H
Filing Date:	03-15-2004	Group Art Unit: 3654
Title:	Method and Apparatus for Tensile Testing and Rethreading Optical Fiber During Fiber Draw	

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AMENDED BRIEF ON APPEAL

This Amended Brief supports the appeal to the Board of Patent Appeals and Interferences from the final rejection dated December 27, 2006, in the application listed above, and is in response to the Notification of Non-Compliant Appeal Brief issued by the Office on July 6, 2007. Appellant filed the Notice of Appeal on March 27, 2007. Appellant now submits this Amended Brief as required by 37 C.F.R. § 41.37.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Corning Incorporated.

II. RELATED APPEALS AND INTERFERENCES

With respect to the related appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences.

III. STATUS OF CLAIMS

Claims 38-49, 52-55, 57, and 58 are pending in this application. Claims 38-49 are rejected. Claims 52-55, 57, and 58 are withdrawn from consideration. Claims 50, 51, and 56 are canceled.

On March 27, 2007 appellant appealed from the final rejections of claims 38-49 which were rejected in the final Office Action dated December 27, 2006. All claims with their current status identifier are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

There were no amendments filed subsequent to the final rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 38 relates to a method of threading a moving length of optical fiber 8 through a component in an optical fiber draw, optical fiber winding or optical fiber testing process, comprising: activating an aspirator 16 to obtain said optical fiber at a first location and moving said aspirator in at least two dimensions to move said optical fiber to a second location to thread said optical fiber through a component (12,14) in said optical fiber draw process 10. (see for example, page 4, lines 16-21, page 9, line 19 through page 10, line 5, and page 14 line 2 through page 17 line 22, as well as Figs. 1, 4A-4E, and 5A-5C).

The methods for threading optical fiber described herein operate in a significantly different manner than prior art methods for threading fiber in a draw process. In particular, an aspirator is used not as a waste fiber disposal device, but instead as a device for capturing and relocating a loose end of optical fiber and thread that fiber through a component in a fiber draw process. This new manner of utilizing an aspirator results in a number of advantages over the prior art. For one thing, by using the aspirator to rethread the optical fiber through various components of the fiber winding system, fiber can continuously be removed and discarded from the manufacturing process as it is simultaneously being threaded through the system. Consequently, the supply of fiber does not have to be stopped in order to rewind or rethread the system. Using the techniques disclosed herein, an entire on-line winding system,

including an on-line prooftesting section, can be rewound in less than 10 seconds. In fact, using the methods and apparatus disclosed herein, rewinding of the entire fiber winding system, including an on-line fiber tensile strength screening device, has been achieved on line during an experimental fiber draw operation in less than 7 seconds. This includes providing a fresh shipping spool, guiding the fiber into winding engagement with the new spool, and beginning winding of the fiber to the new spool. Because the present invention enables rethreading of the fiber winding system in such a short period of time, tension proof testing of optical fiber during the optical fiber draw process can be achieved, even at a draw speed of 25-30 m/sec. or more, without losing a significant amount of fiber.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The claims are currently rejected by the Patent Office as follows:

1) Claims 38-49 are rejected under 35 U.S.C §103(a) as being anticipated over Bacon et al (U.S. 6,027,062) in view of Isoard (U.S. 4,206,883).

VII. ARGUMENT

The rejection of Claims 38-49 under 35 U.S.C. §103(a) as being unpatentable over Bacon (U.S. Patent No. 6,027,062) in view of Isoard (U.S. 4,206,883) is improper.

The Examiner asserts that Bacon discloses an apparatus and method of threading a moving length of fiber through a component in an optical fiber draw, optical fiber winding or optical fiber testing process. The Examiner admits that Bacon fails to teach the positioning device being an aspirator, but submits that "It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the positioning device of Bacon to include an aspirator to hold the fiber as suggested by Isoard, to hold the fiber while transferring and threading the fiber without causing damage to the fiber."

A proper *prima facie* showing of obviousness requires the examiner to satisfy three requirements. First the prior art relied upon, coupled with knowledge generally available to one of ordinary skill in the art, must contain some suggestion which would have motivated the skilled artisan to combine references. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the Examiner must show that, at the time the invention was made, the proposed modification had a reasonable expectation of success. See Amgen v.

Chugai Pharm. Co., 927 F.2d 1200, 1209, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Finally the combination of references must teach or suggest each and every limitation of the claimed invention. See In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

No motivation to combine.

Applicants submit that one would not be motivated to combine the teachings of Bacon and Isoard as proposed. Optical fiber such as is employed in applicant's invention and in the Bacon reference is much stiffer and more brittle than the yarns which are employed in the Isoard reference, and therefore Isoard is non-analogous art.

The closest the Patent Office comes to indicating any motivation for combining the teachings of Isoard and Bacon is in the latest final rejection, where the Patent Office indicates that the aspirator as taught by Isoard will cause less damage to the fiber. In the Advisory Action dated March 21, 2007, the Patent Office again indicates that "it is inherent that the use of an aspirator to position optical fiber would cause less potential damage to the fiber than a positioning device that contacts the fiber." In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. Ex Parte Levy, 17 USPQ2d 1401 (BPAI 1990). Applicants submit that there is no teaching, in any of the references cited, that the aspirator in Isoard will cause less damage to optical fiber than the positioning device disclosed in Bacon. Thus, clearly the Patent Office is not able to point to any statement in the prior art that would provide support for the proposal that using an aspirator would inherently cause less damage to the fiber, thus the Patent Office has failed to identify a motivation to combine the references in the manner proposed. In stating that the use of an aspirator will cause less damage to the fiber, the Examiner thus appears to be opining on knowledge of one of ordinary skill in the art. However, as evidenced by the Declaration under 35 U.S.C. §1.132 attached herewith by Kirk Bumgarner (one of the inventors of the Bacon process as well as the process of the present invention, and thus clearly one of skill in the art), an aspirator will not cause less damage to the fiber. In fact, the method disclosed in Bacon produces optical fiber of the same quality as optical fiber made using a process as disclosed and claimed by applicants. The Patent Office has provided no basis in fact and/or technical data to support the statement by the Patent Office is not correct. Further, a Declaration submitted by one of skill in the art clearly indicates that this assertion is not the case. Applicants submit that these points illustrate that

the proposed modification is a hindsight reconstruction of applicants claimed invention.

Also, contrary to the position of the Patent Office, the words "fiber" and/or "optical fiber" are never mentioned in Isoard. The teaching of Isoard relates to methods for transferring a plurality of textile yarns, not a single strand of optical fiber. As explained above, for this reason alone (the difference between a plurality of yarns and a single strand of optical fiber) one would not combine the teachings of these two references. Optical fiber is an extremely fine (about 150 microns diameter) and stiff material, while yarn is considerably thicker and much more flexible. Optical fiber is also comparatively much more delicate than yarn, e.g., optical fiber if bent can be easily broken, while the same is not true of textile yarns. Thus, optical fiber is much more easily damaged that textile yarns.

According to the Patent Office, "Isoard teaches activating an aspirator 13 mounted on a carriage 17, to obtain the fiber at a first location 3, 4 (position I) and moving the fiber to a second location (position II) to thread the fiber through a component 7, 8 in the fiber draw process (Fig. 3, col. 4 line 58 to col. 5 line 28)."

Applicants respectfully disagree and submit that even if, assuming arguendo, the references were properly combinable, such a combination would clearly not result in applicants invention. First, contrary to what the Patent Office claims is described in Isoard, Isoard clearly does not move aspirator 13 from a first location 3,4 to a second location to thread the fiber (yarn) through either of components 7 or 8. This concept is neither shown in Fig, 3 nor in the passage referred to by the Examiner (col 4 line 58 to col 5 line 28).

Instead, the aspirator 13 in Isoard is moved from the first location at one end of the slide rail 11 to a second location at the other end of the slide rail 11 (notably not threading a component in an optical fiber draw process, or any other process, for that matter). At this point "The positioning of each yarn on its wind-up spindle 7 or 8 is effected by means of the catching nozzle 16, as in the preceding case." In particular, the preceding case, which is described at column 4, lines 32-35, involves having an operator manually anchor the yarns to their respective spindles after they have been seized by the catching nozzle 16. Consequently, it is clear that, even if the references were combinable as proposed by the Patent Office, such a combination would not result in applicant's claimed invention, as the aspirator employed in Isoard is not utilized to thread an optical fiber through a component in an optical fiber draw process.

Further, one of skill in the art would not be motivated to utilize the aspirator from

Isoard as the mechanical positioning device in Bacon, as an aspirator is already employed in Bacon for a completely different purpose, namely, to provide tension on the fiber so that the mechanical armature (i.e., engaging portion 92) can feed the fiber through the winding process. Thus, modifying the teachings of Bacon would destroy the intended function of the aspirator already present in Bacon, namely to remove waste fiber.

Lastly, merely replacing the positioning device in Bacon with the aspirator of Isoard as suggested by the Examiner would not work, as the pressure employed in Isoard is likely much less than that of the aspirator employed in Bacon due to the fact that the Isoard device is working with yarn which is considerably more flexible and of larger diameter than optical fiber. Consequently, the other aspirator 80 in Bacon would simply continue to draw fiber such that the aspirator from Isoard would likely not be able to capture any of the fiber and the proposed modified device would not work. In this respect, the Examiner has indicated only that the device in Isoard should be substituted for the positioning device in Bacon. The Examiner does not indicate in the proposed motivation what happens to the already present aspirator 80 in Bacon, or how the two aspirators from Bacon and Isoard will work together with one another.

For at least the reasons given above, Appellants assert that the Examiner has failed to make a *prima facie* case of obviousness, and that the Board should reverse the §103 rejection and find that claim 38 is allowable over the prior art of record.

Claim 45

Claim 45 requires engaging the optical fiber at a point between the source of the optical fiber and the aspirator and moving the engaged optical fiber to facilitate threading of the fiber through at least one component of the optical fiber draw process.

According to the Patent Office with respect to claim 45, "Bacon as modified by Rausch teaches engaging the fiber at a point between the aspirator the source of the fiber, and winding the engaged fiber onto said spool and is engaged by a snagger tooth located on the spool."

Claim 46

Claim 46 depends from claim 45, and thus requires engaging the optical fiber at a point between the source of the optical fiber and the aspirator and moving the engaged optical fiber to facilitate threading of the fiber through at least one component of the optical fiber

draw process, wherein said engaging step comprises engaging a moving length of optical fiber, moving said engaged length of moving optical fiber into contact with a capstan to thereby thread said optical fiber around said capstan.

According to the Patent Office, "In regards to claim 46-47, Bacon as modified by Isoard teaches moving the fiber into contact with a capstan 11.

Applicants respectfully disagree and further submit that claims 46 and 47 require more than merely contacting fiber with a capstan, e.g., claim 46 requires engaging the optical fiber between the source of the fiber and the aspirator and moving the engaged fiber into contact with a capstan to thereby thread said optical fiber around said capstan. Neither Bacon nor Isoard, alone or in combination, describe threading of fiber around a capstan at all. In Bacon, for example, the threading device 91, 92 is never utilized to thread fiber onto the capstan 11. and instead the positioning device is positioned to engage the fiber after the fiber emerges from the already threaded capstan. Also, claim 46 depends from claim 45, with respect to which the Patent Office indicated that the engaging step involved "engaging a snagger tooth located on the spool." Thus, the Patent Office appears to propose that the snagger tooth identified in the rejection of claim 45 somehow also "moves the fiber into contact with the capstan 11" as required by claim 46. This proposal is clearly erroneous. In Bacon, there is no teaching whatsoever of automatically threading fiber through a capstan apparatus, and it would appear impossible for a snagger tooth on a fiber storage spool to do so.

Claim 47

Claim 47 depends from claim 46m and thus additionally requires that simultaneous with the threading of the capstan, the aspirator is moved to a second location proximate to the winding spool. Thus, claim 47 requires a method wherein, simultaneous to the fiber being wound onto the capstan (as set forth in claim 46) the aspirator is being moved to a second location. As explained above, Isoard and Bacon do not suggest auto threading of a capstan at all, thus these references certainly do not describe threading of a capstan simultaneous to the fiber being moved to a second location via the aspirator. No such process is mentioned or suggested by either Bacon or Isoard, alone or in combination.

Conclusion

In conclusion, Appellants request a reversal of each of the grounds of rejection

maintained by the Examiner and prompt allowance of the pending claims 38-49.

Please charge the fees due under 37 C.F.R. § 1.17(c) to Deposit Account No. 03-3325. If there are any other fees due in connection with the filing of this Brief on Appeal, please charge the fees to our Deposit Account No. 03-3325. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

Dated: July 13, 2007

By: _____

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CERTIFICATE OF MAILING (37 CFR 1.8a)
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope Addressed to: Mail Stop Appeal Brief, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on July 13, 2007.

_____
Robert L. Carlson

VIII. CLAIMS APPENDIX

The claims on appeal are as follows:

38. (rejected) A method of threading a moving length of optical fiber through a component in an optical fiber draw, optical fiber winding or optical fiber testing process, comprising:

activating an aspirator to obtain said optical fiber at a first location and moving said aspirator in at least two dimensions to move said optical fiber to a second location to thread said optical fiber through a component in said optical fiber draw process.

39. (rejected) The method of claim 38, wherein said moving length of optical fiber is a moving length of optical fiber in an optical fiber draw process, and said method further comprises orienting at least a first, second, and third pulley so that, when said aspirator moves said optical fiber to said second location, said pulleys are disposed along the length of said optical fiber and on alternating sides of said optical fiber, and said method further comprises moving said second pulley across the path of said optical fiber to retain said optical fiber in contact with said first, second, and third pulleys, thereby causing said optical fiber to move in a serpentine path.

40. (rejected) The method of claim 38, wherein said aspirator is moved to guide said optical fiber onto at least one guide pulley by said aspirator guiding said optical fiber between or against a pair of surfaces which are disposed on each side of said guide pulley, said surfaces sloping toward said guide pulley to thereby guide said optical fiber onto said guide pulley.

41. (rejected) The method of claim 39, wherein said aspirator is moved to guide said optical fiber onto at least one guide pulley by said aspirator guiding said optical fiber between or against a pair of surfaces which are disposed on each side of said guide pulley, said surfaces sloping toward said guide pulley to thereby guide said optical fiber onto said guide pulley.

42. (rejected) The method of claim 38, wherein said second location is proximate to a optical fiber winding spool.

43. (rejected) The method of claim 42, further comprising engaging said optical fiber at a point along said optical fiber which is between the aspirator and the source of optical fiber, and winding said engaged optical fiber onto said spool.

44. (rejected) The method of claim 43, wherein said engaging said optical fiber comprises engaging said optical fiber by a snagger tooth which is located on said spool

45. (rejected) The method of claim 38, further comprising engaging said optical fiber at a point along the length of said optical fiber which is between the source of said optical fiber and said aspirator, and moving said engaged optical fiber to facilitate threading of said optical fiber through said at least one component of said optical fiber draw process.

46. (rejected) The method of claim 45, wherein said engaging an optical fiber step comprises engaging a moving length of optical fiber, moving said engaged length of moving optical fiber into contact with a capstan to thereby thread said optical fiber around said capstan.

47. (rejected) The method of claim 46, wherein simultaneous with said threading of said capstan, said aspirator is moving to said second location, and said second location is proximate to a winding spool.

48. (rejected) The method of claim 47, wherein said moving length of optical fiber is a moving length of optical fiber in an optical fiber draw process, and said method further comprises orienting at least a first, second, and third pulley so that, when said aspirator moves said optical fiber to said second location, said pulleys are disposed along the length of said optical fiber and on alternating sides of said desired optical fiber, and said method further comprises moving said second pulley across the path of said optical fiber to retain said optical fiber in contact with said first, second, and third pulleys, thereby causing said optical fiber to move in a serpentine path.

49. (rejected) The method of claim 48, further comprising moving said aspirator to guide said optical fiber onto at least one guide pulley by said aspirator guiding said optical fiber between or against a pair of surfaces which are disposed on each side of said guide pulley, said surfaces sloping toward said guide pulley to thereby guide said optical fiber onto said guide pulley.

50. (canceled)

51. (canceled)

52. (withdrawn) A method of changing optical fiber storage spools in an optical fiber winding process, comprising:

cutting the fiber being fed from a fiber supply source after a first fiber storage spool has received a desired amount of optical fiber;

capturing the fiber being supplied from said fiber supply source in an aspirator; and

moving said aspirator and a second fiber storage spool with respect to one another to rethread the fiber onto said second fiber storage spool.

53. (withdrawn) The method of claim 52, wherein said fiber supply source is a moving length of fiber in a fiber draw operation.

54. (withdrawn) The method of claim 52, wherein a snagger tooth on said second storage spool snags said fiber onto said second storage spool.

55. (withdrawn) The method of claim 52, wherein said aspirator is moved in at least two dimensions to wind said fiber onto said second storage spool.

56. (canceled)

57. (withdrawn) In a process for winding a length of fiber being drawn in an optical fiber

preform in a fiber draw process onto at least one storage spool, the improvement comprising, after the length of fiber has begun to be stored on said at least one storage spool, identifying fiber which is out of specification and removing said out of specification fiber from the source of fiber before the fiber is wound onto said at least one storage spool.

58. (withdrawn) The method of claim 57, wherein said method comprises winding said length of fiber onto a first storage spool, and said method further comprises cutting and removing a portion of said length of fiber, and rewinding at least a portion of the remainder of said length of said fiber onto a second storage spool.

IX. EVIDENCE APPENDIX

Declaration of Kirk Bumgarner under 37 CFR 1.132, submitted along with Response After Final dated Feb. 27, 2007.

X. RELATED PROCEEDINGS APPENDIX

None